

SCREENS: SUCCESS OR SABOTAGE FOR SCHOOLS?

A DISCUSSION OF CHILDREN, SCREENS & LEARNING

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MEDICAL DIRECTOR, REACH OUT AND READ WISCONSIN



...this discovery of yours will create forgetfulness in the learners' souls, because they will not use their memories; they will trust to the external written characters and not remember of themselves. The specific which you have discovered is an aid not to memory, but to reminiscence, and you give your disciples not truth, but only the semblance of truth; they will be hearers of many things and will have learned nothing; they will appear to be omniscient and will generally know nothing; they will be tiresome company, having the show of wisdom without the reality.

Plato, *Phaedrus*, ~370 BC
on the new-fangled “writing”

Forty percent of 3-month-old infants are regular viewers of screen media.

19% of babies under 1 year of age have a TV in their bedroom.



1970:
Children began watching television
at age 4 years



Today:
Children begin
watching television
at age **4 months**.



One

**WHAT DO WE KNOW
ABOUT SCREEN TIME?**

Young Children & Screens

What do we know?



Fall 2013

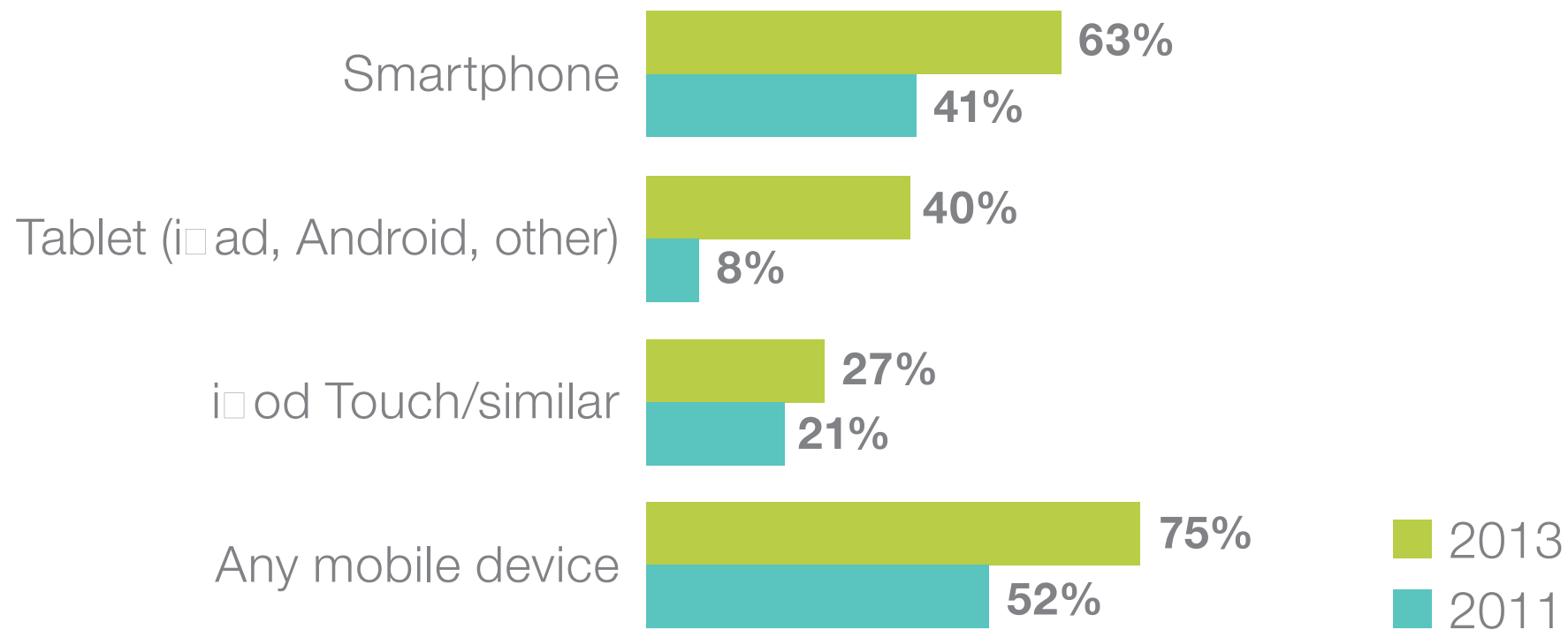
Zero to Eight

Children's Media Use in America

Mobile device use is, unsurprisingly, increasing.

Ownership of Mobile Media Platforms, over Time

Among 0- to 8-year-olds, percent with each of the following in the home:



Even very young children are frequent digital media users.

Table 16: Screen Media Activities Ever Engaged in by Children Under 2, over Time

Among children under 2, percent who have ever:

	2011	2013
Watched TV	66%	66%
Watched DVDs	52%	46%
Used a mobile device (smartphone, iPod Touch, tablet)	10% ^a	38% ^b
Used a computer	4% ^a	10% ^b
Played video games (console)	3%	4%
Played video games (handheld player)	NA ⁺	6%

⁺ Not asked in 2011

There continues to be a substantial digital divide, including both computers and mobile devices.

Table 26: Internet and Mobile Media Access, by Income, 2013

Among 0- to 8-year-olds:

Percent who have each of the following in their households:	Total	Parent Income		
		Lower (<\$30k)	Medium (\$30-75k)	Higher (\$75k+)
High-speed Internet access	69%	46% ^a	71% ^b	86% ^c
Smartphone	63%	51% ^a	62% ^b	76% ^c
iPod Touch or similar device	27%	16% ^a	25% ^b	39% ^c
Tablet	40%	20% ^a	36% ^b	63% ^c
Any Internet-enabled mobile device (smartphone, iPod Touch, tablet, or similar device)	75%	61% ^a	73% ^b	91% ^c
Percent whose parents have downloaded:				
Any apps for child to smartphone, iPod Touch, or tablet	58%	41% ^a	54% ^b	79% ^c
Any <i>educational</i> apps for child to smartphone, iPod Touch, or tablet	53%	35% ^a	49% ^b	75% ^c
Among those who own a mobile device, percent who have downloaded:				
Any educational apps for their child	69%	57% ^a	64% ^a	80% ^b

But...

Table 27: Access to and Use of Mobile Media Among Lower-Income Families, over Time

Among 0- to 8-year-olds in families earning under \$30,000 a year, the percent:

	2011	2013
Who have mobile devices in their home		
Smartphone	27% ^a	51% ^b
Tablet device	2% ^a	20% ^b
Whose parents have downloaded any apps to a smartphone for them	14% ^a	31% ^b
Who have ever used a smartphone, tablet, or similar device	22% ^a	65% ^b

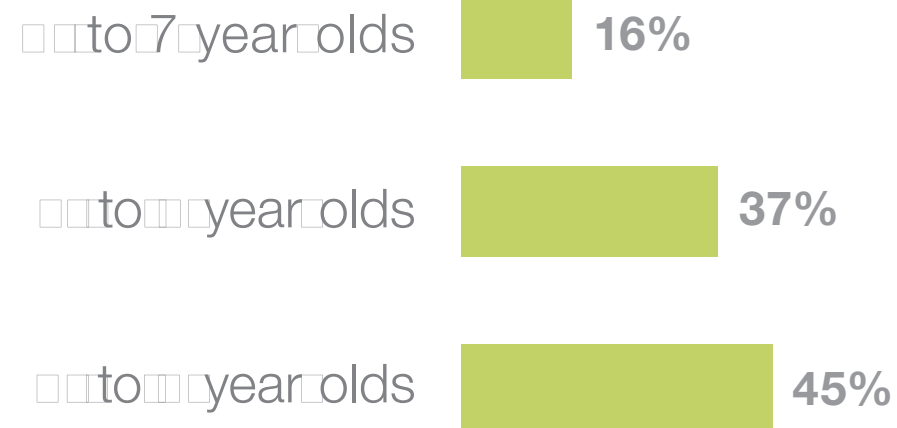
Does income matter when it comes to TV?

	Under \$30,000 a year			\$30,000-75,000 a year		
	White	Black	Latino	White	Black	Latino
Percent of homes with TV on all or most of the time	46%	45%	46%	37% ^a	70% ^b	30% ^a
Percent with TVs in their bedrooms	50%	60%	60%	27% ^a	63% ^b	42% ^c
Average time spent watching TV per day	:43 ^a	1:24 ^b	1:23 ^b	1:02	1:15	:51

TVs in Bedrooms...far more common than you'd think.

TV in the Bedroom, by Age, 2013

Percent of children with a TV in their bedrooms:



TVs in Bedrooms...far more common than you'd think.

Table 7: Why Children Have TV in Their Bedrooms, 2013

Among the 1,000 of 11 to 17 year olds with a TV in their rooms, the percent of parents who cite each of the following as a reason:

	A reason	Main reason
Frees up other TVs so family members can watch their own shows	41%	22%
Keeps the child occupied so parent can do other things	28%	13%
Child shares a room with an older sibling	24%	12%
It helps the child fall asleep	22%	12%
Family bought a new TV and decided to give child the old one	16%	9%
To get child to sleep in his/her own room	14%	7%
It was a reward for good behavior	12%	8%
Child shares a room with an adult	11%	11%
Child sleeps in a family room with a TV in it	4%	4%

Children under 2 spend twice as much time watching TV and videos as they do reading books.

Table 1: Time Spent With Media, By Age, 2013

Time spent using media in a typical day:

	Among all	Child age		
		0-1	2-4	5-8
Watching TV	:57	:44 ^a	1:04 ^b	:58 ^{ab}
Reading/being read to	:28	:19 ^a	:29 ^{ab}	:32 ^b
Watching DVDs	:22	:11 ^a	:26 ^b	:25 ^b
Listening to music	:20	:34 ^a	:18 ^b	:15 ^b
Playing games on a mobile device ⁺	:08	:01 ^a	:07 ^b	:12 ^{ab}
Playing console video games	:06	* ^a	:02 ^b	:12 ^c
Playing computer games	:05	* ^a	:03 ^b	:09 ^c
Watching TV/video on a mobile device ⁺	:05	:01 ^a	:06 ^b	:05 ^{ab}
Playing handheld video games ⁺⁺	:04	:00 ^a	:02 ^a	:08 ^b
Watching TV/videos on a computer	:03	* ^a	:02 ^{ab}	:04 ^b
Using other apps on a mobile device ⁺	:02	*	:03	:03
Using educational software on a computer	:02	:01	:03	:02
Doing homework on a computer	:01	:00 ^a	:00 ^a	:02 ^b
Doing anything else on a computer ⁺⁺⁺	*	*	*	:01
Total screen media	1:55	:58	1:58	2:21

+ Such as a smartphone or tablet ++ On a device such as a Game Boy, PSP, or DS +++ Such as photos, graphics, or social networking

* Less than 1 minute but more than 0.

How frequently do children under age 2 use different types of media?

Table 18: Frequency of Media Use Among Children Under 2, 2013

Among children under 5 percent who:

	Daily	Weekly	Less often	Never
Read/are read to	48%	25%	5%	19%
Watch TV	31%	24%	11%	30%
Watch DVDs	11%	19%	15%	47%
Use a mobile device	6%	8%	12%	67%
Use ebooks	3%	2%	4%	84%
Use a computer	1%	5%	4%	82%
Play console video games	1%	2%	2%	87%
Play handheld video games	*	2%	3%	87%

Note: "Daily" includes several times a day or once a day; "weekly" includes several times a week or once a week. * Indicates a value of less than 1 percent but greater than 0.5 percent.

How frequently do children under age 2 use different types of media?

Table 19: Types of Media Content Used by Children Under 2, 2013

Among children under 5 percent who have ever:

Watched educational shows on TV	88%
Watched kids' entertainment shows on TV	88%
Played educational games/activities on a mobile device	88%
Watched general audience shows on TV	82%
Watched adult shows (e.g. 5CS)	82%
Used educational games/programs on a computer	82%
Gone to educational or informational websites	82%
Played games on an educational device (e.g. Leapster)	82%
Played educational games on a video game console	82%
Played educational games on a handheld game player	82%

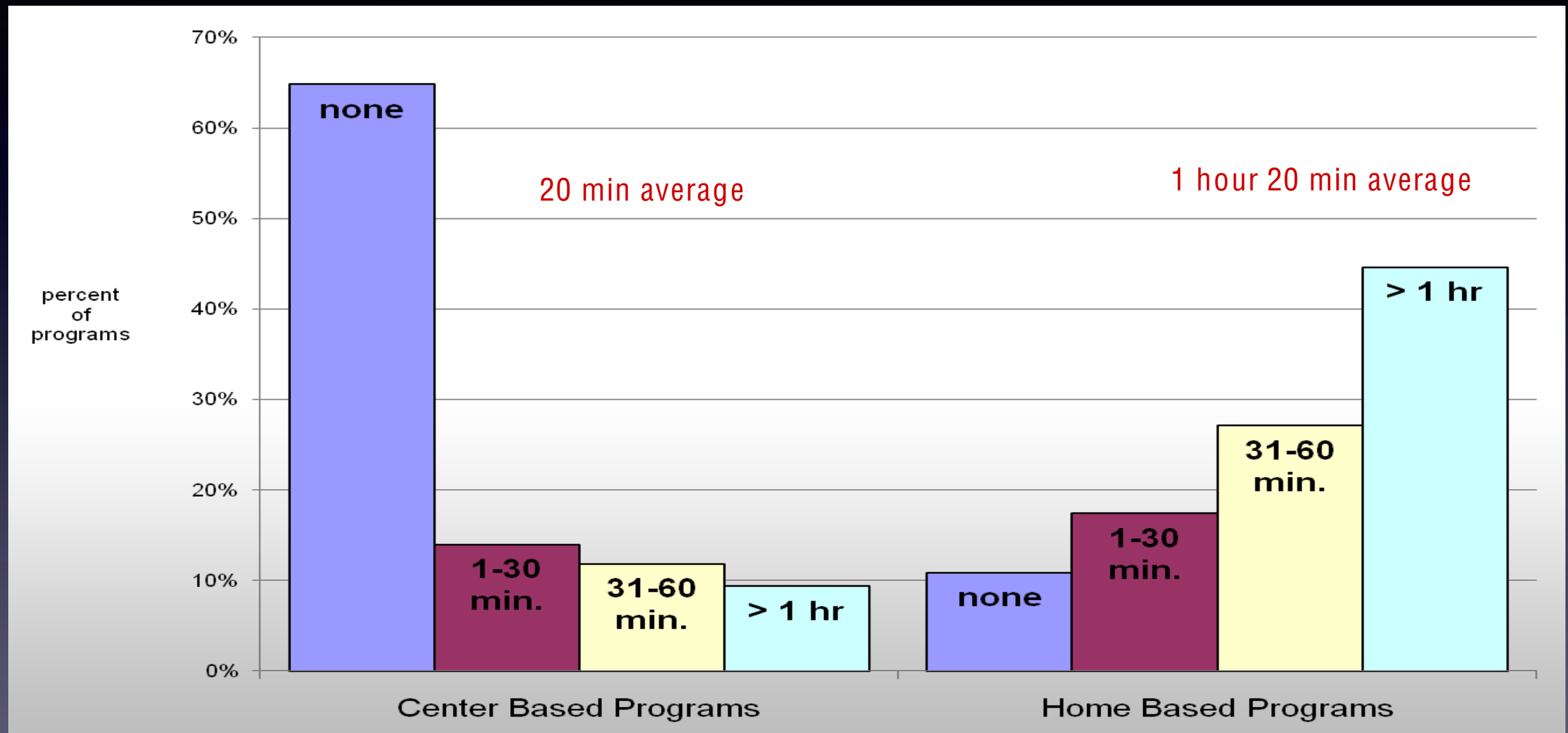
Table 22: Use of Media to Occupy a Child or Parent, 2013

Among parents of 0- to 8-year-olds, percent who say they often or sometimes:

	Often	Sometimes
Let child play with handheld video game player when running errands together ⁺	17%	49%
Give child the parent's smartphone or tablet to use when running errands together ⁺⁺	13%	31%
Use media to occupy child when doing chores at home	13%	42%
Use media to occupy parent when out playing with child ⁺⁺	6%	26%
Give child headphones and video to watch when at a meeting, class, or other activity ⁺⁺	2%	14%

⁺ Among those who own a handheld videogame player such as a Gameboy, PSP, or DS (n=551) ⁺⁺ Among those who own a mobile device such as a smartphone or tablet (n=1163)

Television Viewing in Child Care Settings



Christakis DA, Garrison MM. Preschool-Aged Children's Television Viewing in Child Care Settings. *Pediatrics* 124(6), December 2009. doi: 10.1542/peds.2009-0862

**More time with screens means
less time interacting with
those around them.**


(This includes co-viewing.)



Each hour of audible TV results
in **636** fewer words from females
in the home environment, and
134 fewer words from males

!

Christakis DA et al. Audible television and decreased adult words, infant vocalizations and conversational turns: a population-based study. Arch Pediatr Adolesc Med. 2009 Jun; 163(6): 554-8. doi: 10.1001/archpediatrics.2009.61

A photograph of a child lying in bed in a dimly lit room. The child is propped up on their elbows, looking towards the camera. A television is visible in the background, glowing with light. The room is dark, with the primary light source being the TV and some ambient light from the window.

**Linked to irregular sleep and
delayed language acquisition**

**Habit-forming: more time
spent with screens means
more difficulty turning them
off as older children**

**Study of 3600 children ages 2-6 years
in eight European nations across two
years. Examined multiple domains
and connection to total screen time.**

**Family functioning
and emotional well-being:
1.2 to 2.0 fold difference**

**Social and peer-related measures:
no effect noted.**

Hinkley T et al. Early Childhood Electronic Media Use as a
Predictor of Poorer Well-being. JAMA Pediatrics, 17 March 2014,
doi: 10.1001/jamapediatrics.2014.94

Selected Statistics for Major Sources of Spoken and Written Language (Sample Means)

		Rank of Median Word	Rare Words per 1000
I.	Printed texts		
	Abstracts of scientific articles	4389	128.0
	Newspapers	1690	68.3
	Popular magazines	1399	65.7
	Adult books	1058	52.7
	Comic books	867	53.5
	Children's books	627	30.9
	Preschool books	578	16.3
II.	Television texts		
	Popular prime-time adult shows	490	22.7
	Popular prime-time children's shows	543	20.2
	Cartoon shows	598	30.8
	<i>Mr. Rogers</i> and <i>Sesame Street</i>	413	2.0
III.	Adult speech		
	Expert witness testimony	1008	28.4
	College graduates to friends, spouses	496	17.3

Adapted from Hayes and Ahrens (1988).

What does the research show?

Some high-quality programs have
benefits for children
older than two years:

improved social skills

language skills

school readiness

What does the research show?

Example: *Sesame Street* (1969)

“Magazine format”

Flexible

Variety

Repetition...
leading to increased attention.

What does the research show?

“Can a daily television program filled with elements of learning attract and hold the attention of four and five year olds—particularly those from deprived homes—in free competition with animated cartoons and ‘shoot-em ups’?”

!

Harold Howe
US Commissioner of Education
1968

But...

Under two years: there may be
deleterious effects...
even from *Sesame Street*.

Young children remember and learn better
from a **live person** than from a video.

Children under 30 months
can not learn from 2-dimensional video
representations.

(but the environment around them can still have an effect on them)

Why?

Lack of symbolic thinking...

Immature attentional controls...

Lack of memory flexibility...

...to transfer 2-D to a 3-D world.

Can a toddler learn from
“word learning videos”?

Yes — but **only** if parents
watch with them and reteach
the words.

**Why do parents flock to “educational”
media for infants and toddlers?**

**“This video will teach your child about
language and logic, patterns and
sequencing, analyzing details, and more.”**

**“Enriching a child’s vocabulary through
the beauty of poetry, music and nature.”**

Baby Einstein package quotes

“The point is that there is so much education in this video as well as interesting images. Some of the images are so interesting they seem to hypnotize.”

Baby Einstein Parental Testimonial

Orienting response
Pavlov (1927)

Individuals stop activity and orient towards a new stimulus

Displacing Play

!

Displacing Sleep

School-Aged Children & Screens

What do we know?

Kaiser Family Foundation (2009)



Among 8–18 year olds,
daily media use:

4h29m of television

2h31m of music

1h29m of computers

1h13m of video games

38m of print

25m of movies

A total of **10h45m** packed
into 7.5 hours/day
(via multitasking)

ATTENTIONAL PROBLEMS?

Each hour of daily television appears to yield about 10% increased risk of inattention later in life.

Each hour of daily cognitive stimulation appears to yield about 20% decreased risk.

The key factor may be **content**.

Content viewed at age 0-3y	Risk of later attention problems
Educational	0%
Entertainment	60% greater
Violent	110% greater

The Newest Detail: Pacing

Lillard AS & Peterson J. The Immediate Impact of Different Types of Television on Young Children's Executive Function. *Pediatrics*, 12 September 2011; 128:e000

60 4-year-olds in three groups:

Free drawing with crayons, markers and paper.

Watch part of a cartoon
“about a typical US preschool-aged boy”.

Watch part of an episode of
“a very popular fantastical cartoon about
an animated sponge that lives under the sea”.



They did their selected activity for nine minutes and were then given identical performance tasks.

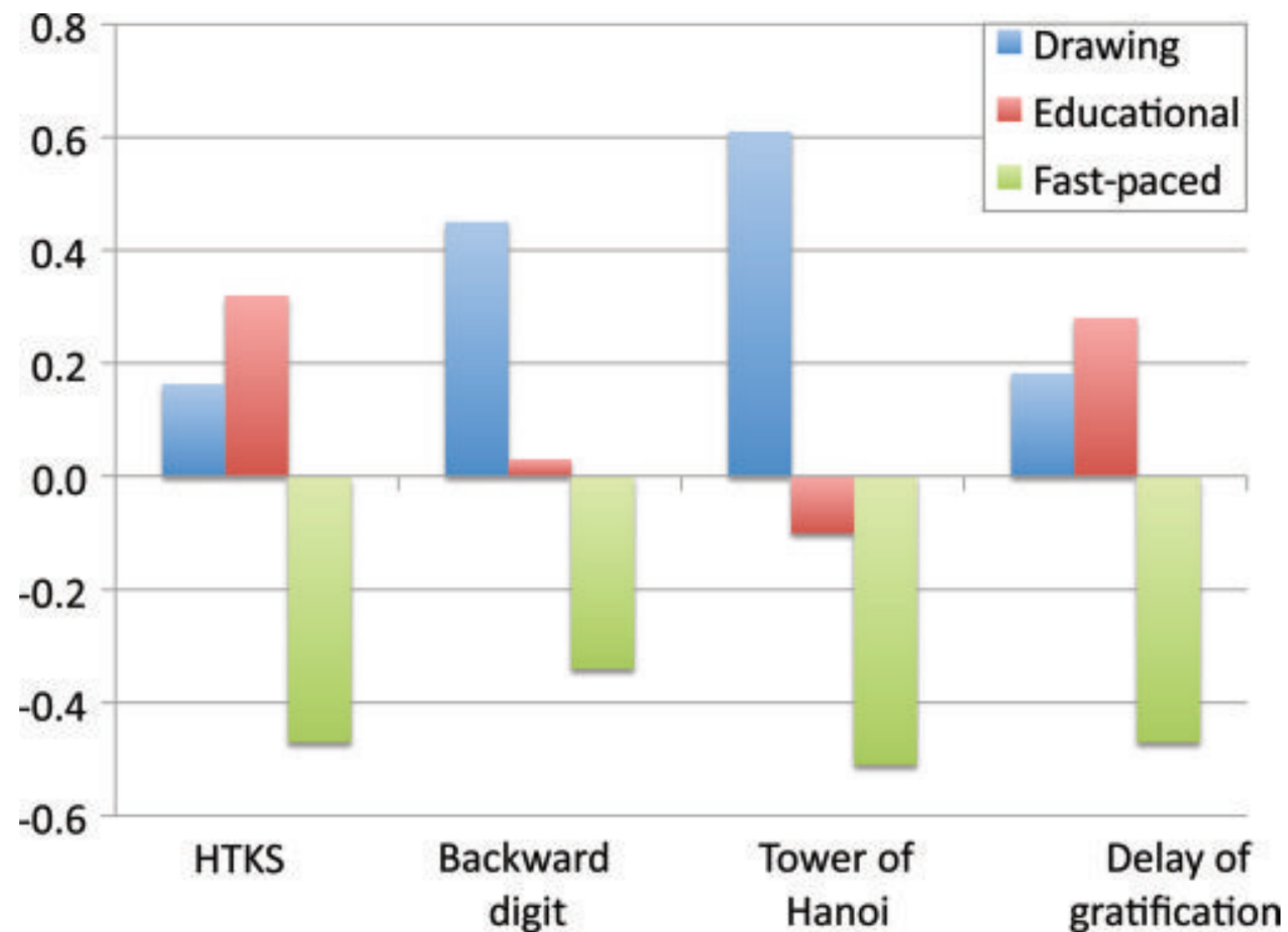
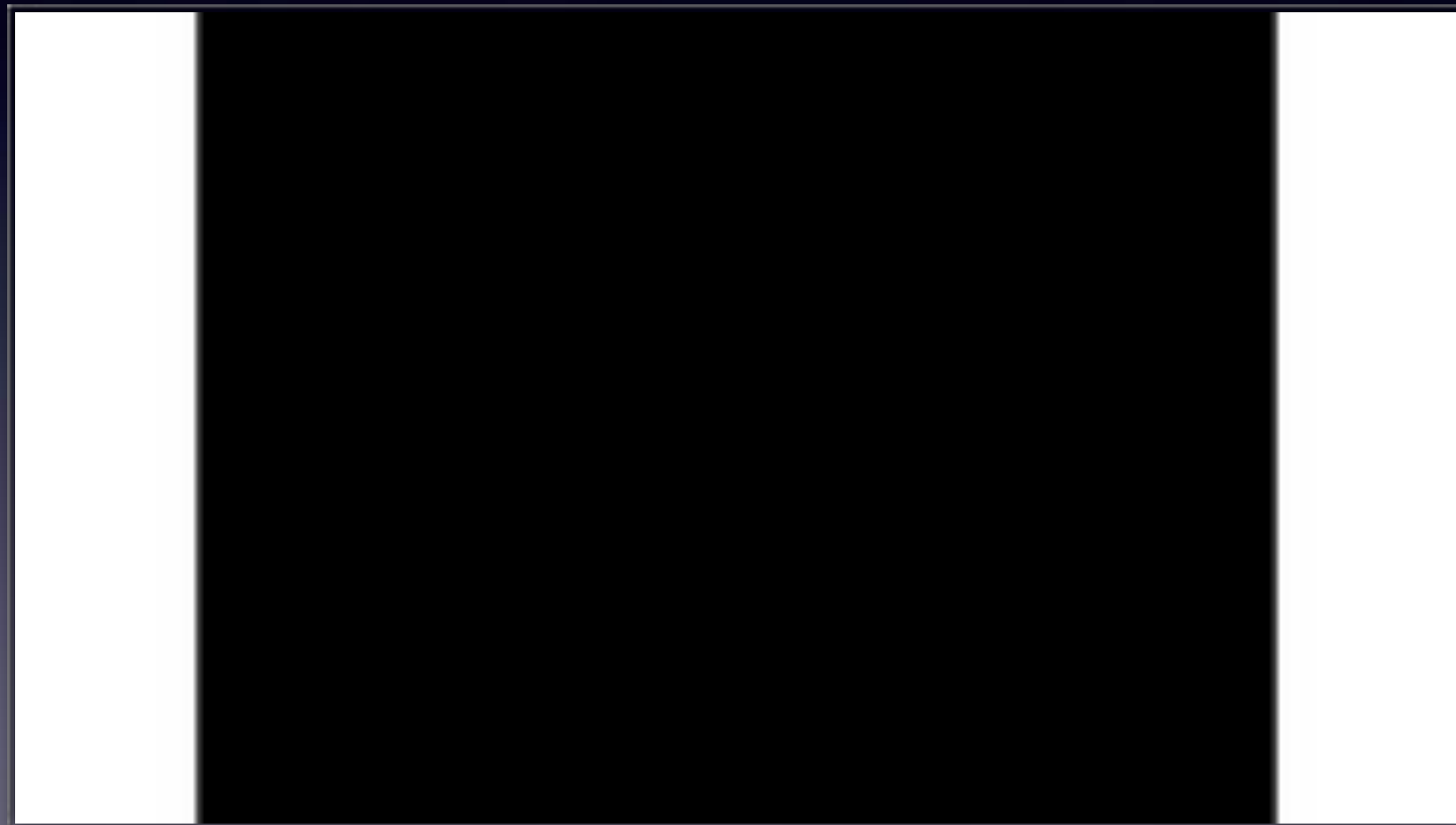


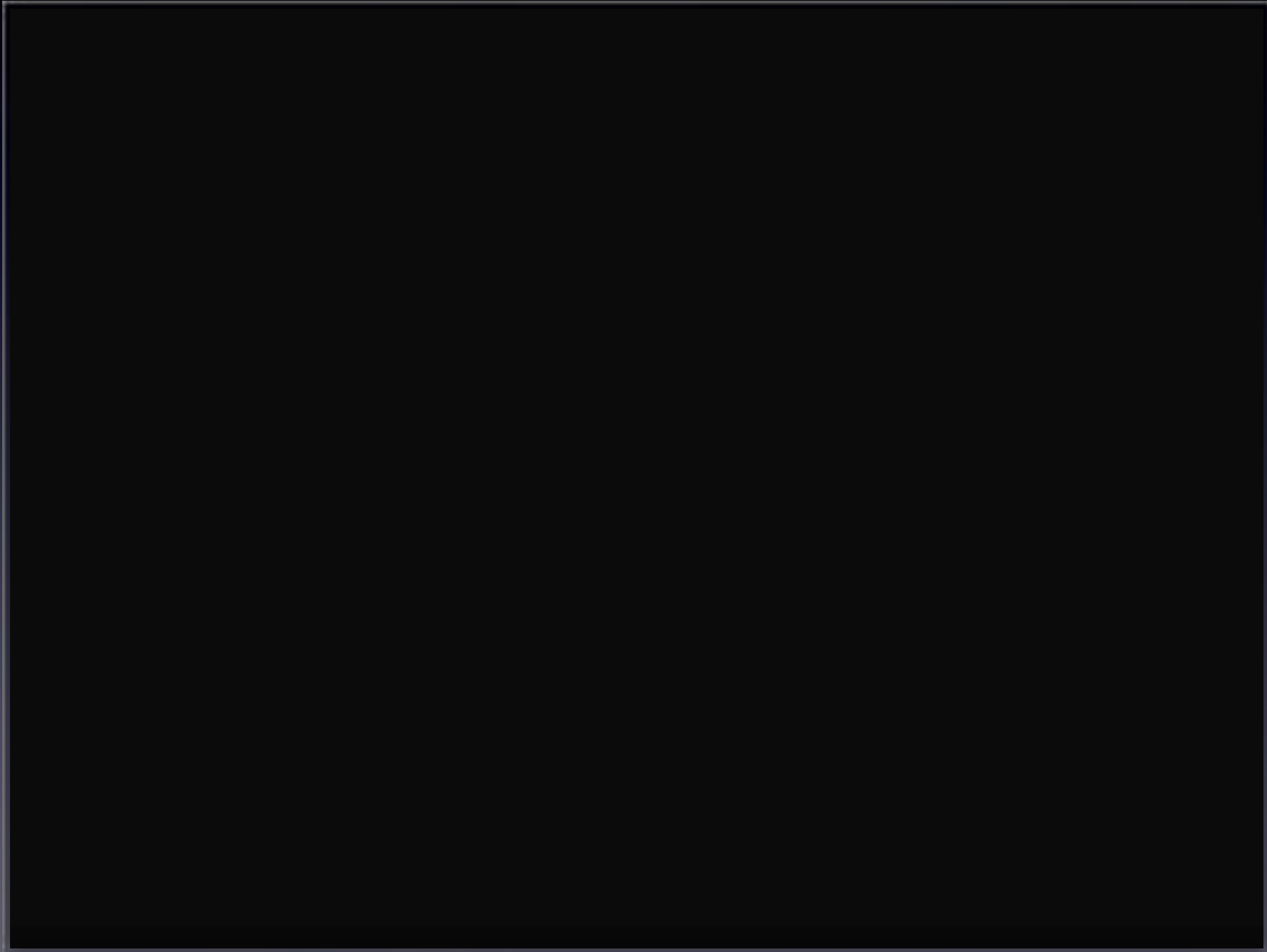
FIGURE 1
z scores for each task.

Baby Macdonald (Baby Einstein)

A Day on the Farm



Mr Rogers' Neighborhood Voting



Screen Time Recommendations

A “blunt knife”...
but getting better.

A photograph of two young children lying on a bed, looking at a tablet. The child on the left is wearing a red shirt and has blonde hair. The child on the right is wearing a white shirt and has dark hair. The tablet is a silver Apple iPad, and the child on the right is touching the screen with their finger. The background shows white pillows and a dark headboard.

What about E-readers?

What about interactivity?

Christakis, JAMA Pediatrics, March 2014

Table. A Comparison of Features of 3 Different Devices Used by Children Younger Than the Age of 2 Years

Feature	Traditional Toys	Touch-Screen Devices	Television
Reactive	✓	✓	
Interactive		✓	
Tailorable		✓	
Progressive		✓	
Can promote joint attention	✓	✓	
Highly portable	✓	✓	
3-Dimensional	✓		

age of 2 years should not be applied to these newer media. Lest one take from this Table the idea that iPads are in fact superior to all play devices, it should also be pointed out that the simple act of reading a book to a child has all 7 features.

Despite of these distinguishing features, there are, at least from my perspective, 2 caveats about the use of these devices. The first is that, as discussed previously, they can displace other activities that are crucial to child development. In particular, caregivers should always ask themselves what their child would otherwise be doing were it not for the omni-available touch screen. For example, I cringe when I see families at restaurants together and each member has their eyes glued to their personal device, thereby bypassing an increasingly rare opportunity for familial engagement. On the other hand, given that 90% of children younger than the age of 2 years currently use television and DVDs

regularly, there is the real possibility that interactive media will displace traditional media, which I would support at least from a harm reduction standpoint.⁹ The second is derived oddly enough from the interactive nature of the device itself. The "I did it!" response, whether stated or felt, manifests itself on a neuronal level with the secretion of dopamine as part of the reward pathway. Think B. F. Skinner's famous rat experiments. The delight a child gets from touching a screen and making something happen is both edifying and potentially addictive. In much the same way as we have seen the emergence of problematic Internet use in older children and adolescents, we may now begin to see compulsive use of iPads among our youngest patients. Therefore, limits on use are in order.

In conclusion, while many of you wait for us to build an evidence base before this technology too is supplanted by some new one, I believe that judicious use of interactive media is acceptable for children younger than the age of 2 years. And finally, the question I will surely be asked is how long should children be allowed to do so each day. My answer is half an hour to 1 hour and here is how I arrived at what is, admittedly, an arbitrary number. First, children that age are only awake for about 8 to 12 hours per day. There is much to be done and much to be learned in those precious few waking hours (displacement concerns). Second, children that age typically engage with other, traditional toys for about half an hour to 1 hour per day on average, and it seems prudent that these devices be used an equivalent amount (compulsion concerns).⁸ In the meantime, there is much work to be done in the laboratory.

Two

**THE SALESMAN
IN THE BEDROOM**

THE EVOLUTION OF POLICY

1934

Federal Communications Commission Act:
“The public owns the airwaves”

late 1970s-early 1980s

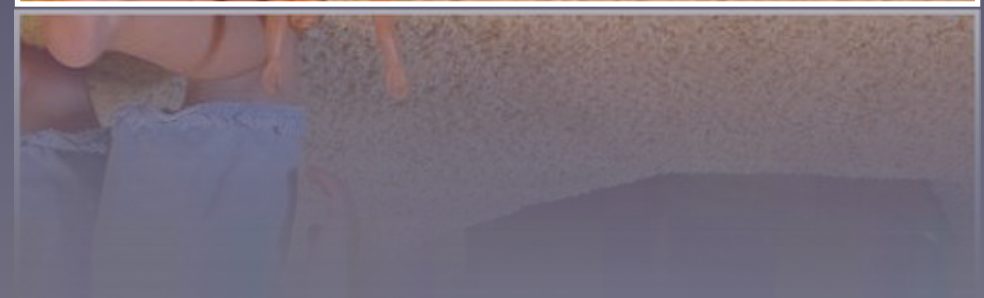
The Federal Trade Commission

1984

The Federal Communications Commission
“Commerical time should be
regulated by the marketplace.”

Children ages 2–18
spend a total of
15,000 to 18000
hours in front of
television sets.

They spend only
12,000 hours in
school.



**In an average year, a television-watching
child will be exposed to:**

**14,000 sexual references,
innuendos and jokes**

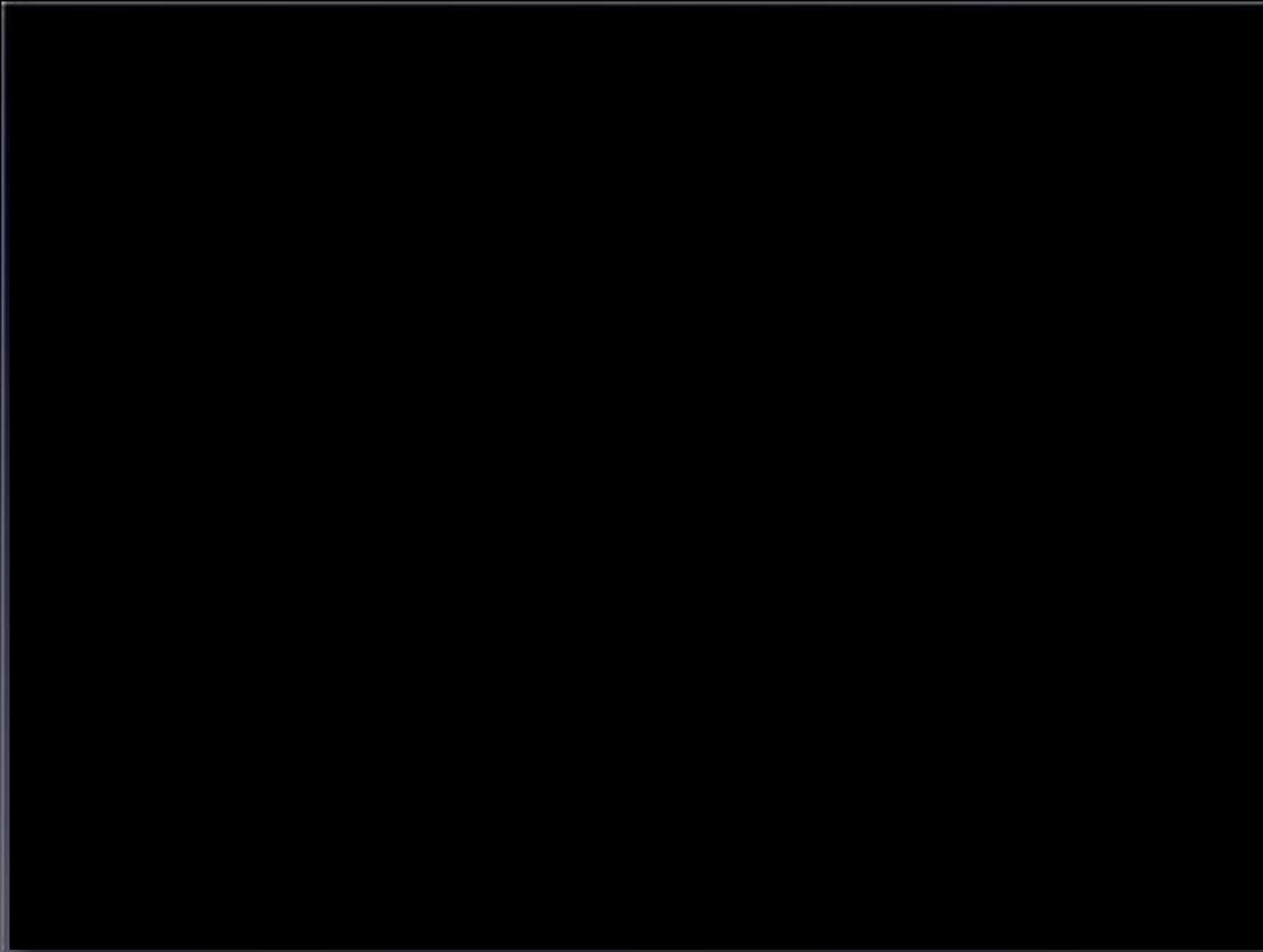
(but under 175 on birth control, abstinence, or STDs)

1000–2000 beer or wine commercials

**1000 murders, rapes,
assaults and armed robberies**

20,000 commercials

The Selling of Violence



Why is media so powerful?

Children learn through observation.

Media gives access to the
“secret world” of adults

Children learn “new scripts”
for interactions:

gender roles
conflict resolution
courtship & sexual gratification

**But children have a hard time
distinguishing fantasy from reality.**

But adults are fine, right?

(adults may also fall prey to this)

Even the Young Ones...



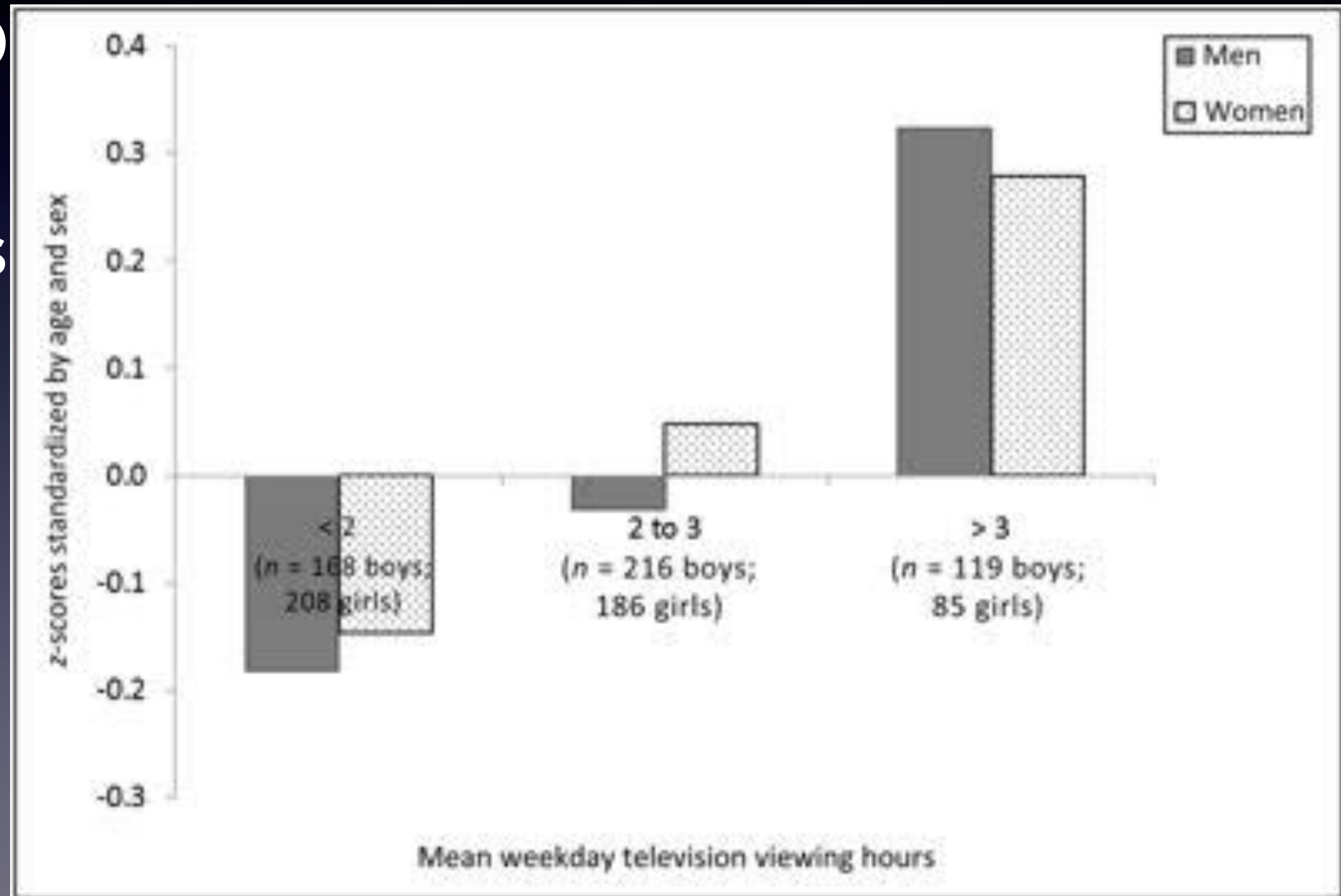
Robertson LA, McAnally HM, Hancox RJ. Childhood and Adolescent Television Viewing and Antisocial Behavior in Early Adulthood. *Pediatrics* 131(3), 1 Mar 2013

10

Thos

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Three

SOLUTIONS?

Take an index card and...

**Write down a challenge you see
in your lives with respect to
conveying these ideas to parents
and the public.**

In groups of *three*,
share what you wrote down.

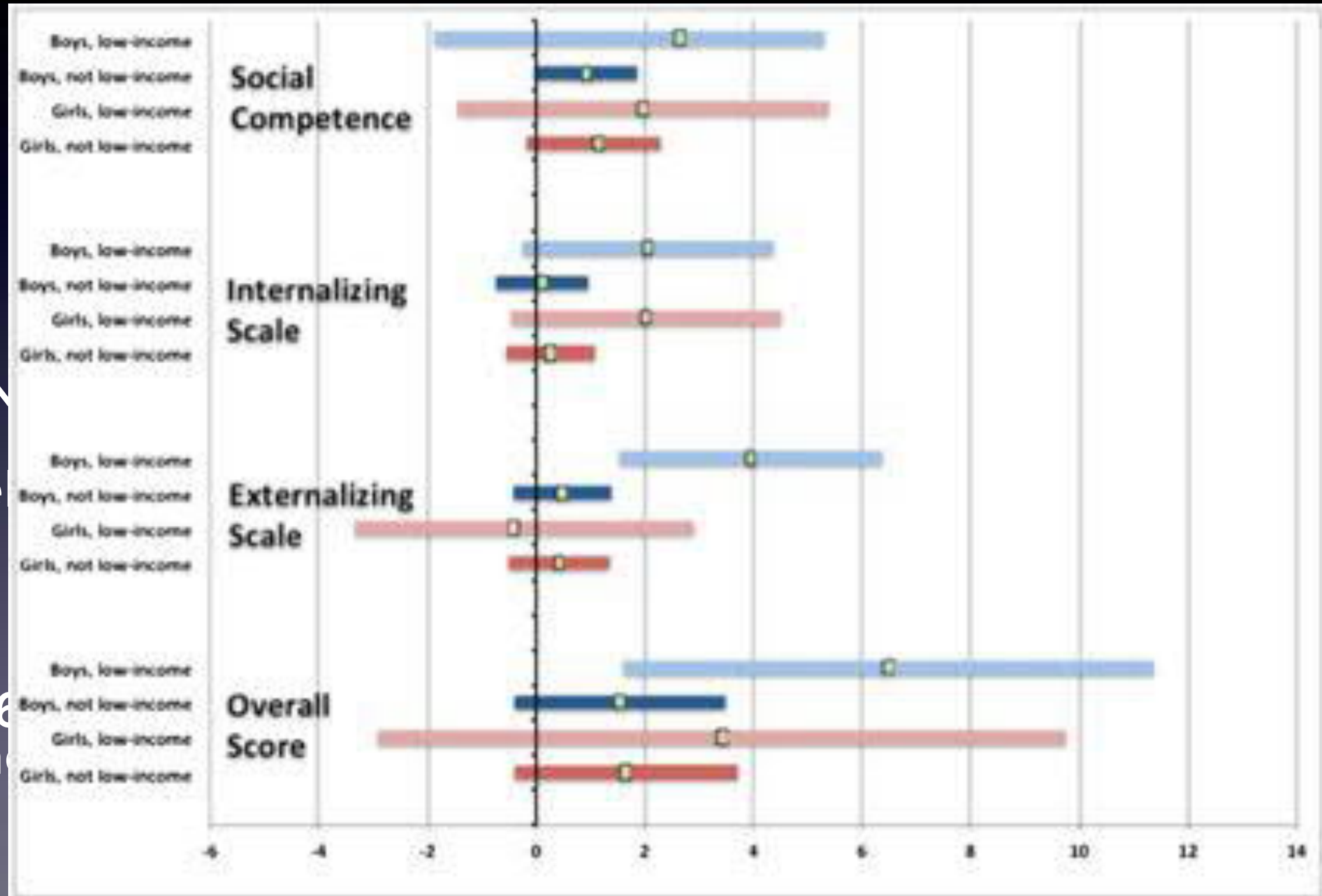
!

Brainstorm some approaches to
addressing these challenges.

!

(Be prepared to share them with the
whole group in a bit...)

Christakis DA, Garrison MM, Herrenkohl T, Haggerty K, Rivara FP, Zhou C, Liekweg K.
 Modifying Media Content for Preschool Children: A Randomized Controlled Trial.
 Pediatrics 131(3), 1 March 2013



Four

SHARING THE MESSAGE

AAP 2016 Recommendations to Parents

Based on **research** evidence.

!

<https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Pages/Media-and-Children.aspx>

Media and Young Minds. American Academy of Pediatrics Council on Communications and Media.
10.1542/peds.2016-2591

AAP 2016 Recommendations to Parents

1.

Avoid digital media use (except
video-chatting) in children younger
than 18 to 24 months.

AAP 2016 Recommendations to Parents

2.

For children ages 18 to 24 months of age, if you want to introduce digital media, choose high-quality programming and use media **together** with your child.

Avoid solo media use in this age group.

AAP 2016 Recommendations to Parents

3.

For children 2 to 5 years of age,
limit screen use to **1 hour per day** of
high-quality programming,
coview with your children,
help children understand what they are seeing,
and help them apply what they learn
to the world around them.

AAP 2016 Recommendations to Parents

4.

Do not feel pressured to introduce
technology early;

interfaces are so intuitive that children will
figure them out quickly once they start
using them at home or in school.

AAP 2016 Recommendations to Parents

5.

Avoid fast-paced programs (young children do not understand them as well),
apps with lots of distracting content,
and any violent content.

AAP 2016 Recommendations to Parents

6.

!

Turn off televisions and other devices
when not in use.

AAP 2016 Recommendations to Parents

7.

Avoid using media as the **only way to calm** your child.

Although there are intermittent times (eg, medical procedures, airplane flights) when media is useful as a soothing strategy, there is concern that using media as strategy to calm could lead to problems with limit setting or the inability of children to develop their own emotion regulation. Ask your pediatrician for help if needed.

AAP 2016 Recommendations to Parents

8.

Monitor children's media content and what apps are used or downloaded.

Test apps before the child uses them, play together, and ask the child what he or she thinks about the app.

AAP 2016 Recommendations to Parents

9.

Keep bedrooms, mealtimes, and parent-child playtimes **screen free** for children and parents.

Parents can set a “do not disturb” option on their phones during these times.

AAP 2016 Recommendations to Parents

10.

No screens 1 hour before bedtime,
and remove devices from bedrooms before bed.

AAP 2016 Recommendations to Parents

11.

!

Consult the American Academy of Pediatrics
Family Media Use Plan, available at:
www.healthychildren.org/MediaUsePlan.

AAP 2016 Recommendations to Industry

Also, for **industry**:

Cease making apps for children younger than 18 months until evidence of benefit is demonstrated.

Eliminate advertising
and unhealthy messages on apps.

Children at this age cannot differentiate between advertisements and factual information, and therefore, advertising to them is **unethical**.

Messages from the 'Growing Up Digital' Media Research Symposium

Media is just another environment.
It can be positive — or negative.

Parenting has not changed.
Set limits. Teach kindness. Be involved.

Role modeling is critical.
Limit your own use, and teach online etiquette.

We learn from each other.
Responsive, nurturing relationships are vital.

Messages from the 'Growing Up Digital' Media Research Symposium

Content matters.

Quality is more important than quantity.

Curation helps.

Use the reliable resources available.

Co-engagement counts.

Your perspective influences how children view their media experience.

Playtime is important.

Unstructured playtime stimulates creativity.

Messages from the 'Growing Up Digital' Media Research Symposium

Set limits.

As with any activity.

It's OK for your teen to be online.

Social relationships and skills can also have an online component.

Create tech-free zones.

Protect mealtime and sleep time.

Kids will be kids.

They'll make mistakes. Teach with empathy.

Take an index card and...

**Write down up to three words
which illustrate the positives of
electronic media.**

!

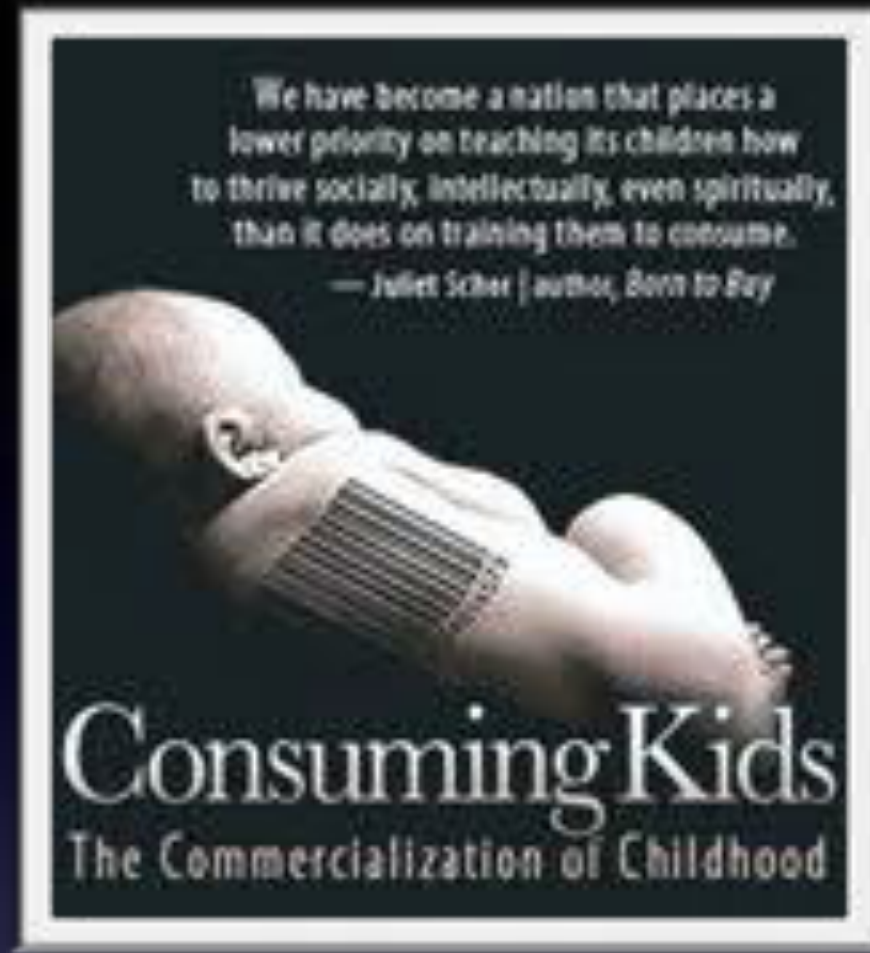
**Write down up to three words
which illustrate the negatives of
electronic media.**

!

**Write down one word which
expresses how you feel after
today's session.**

The Times (London), 1834

“That it will **ever** come into general use, notwithstanding its value, is extremely doubtful; because its beneficial application requires much **time** and gives a good bit of **trouble** both to the patient and the **practitioner...**”



Video interviews from
Consuming Kids:
The Commercialization of Childhood

Media Education Foundation
2008

!

Baby Einstein and Mister Rogers' Neighborhood

clips available on YouTube
accessed 2012

facebook.com/DrLibrarian
twitter.com/dnavsaria
dnavsaria@pediatrics.wisc.edu

THE
END

READ
INSTEAD